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EFFECTIVE RESPONSE REINFORCEMENT;
AN EDUCATIONAL PROGRAM FOR MANAGEMENT

CHESTER W. BURCHETT
and
ROBERT L. JENSEN

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EFFECTIVE RESPONSE REINFORCEMENT
AN EDUCATIONAL PROGRAM FOR MANAGEMENT

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Chester W. Burchett

and

Robert L. Jensen

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EFFECTIVE RESPONSE REINFORCEMENT
AN EDUCATIONAL PROGRAM FOR MANAGEMENT

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Lieutenants

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United States Naval Postgraduate School
Monterey, California

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AN EDUCATIONAL PROGRAM FOR MANAGEMENT

by

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Submitted in partial fulfillment of
the requirements for the degree of

MASTER OF SCIENCE
IN
MANAGEMENT

United States Naval Postgraduate School
Monterey, California

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Chester W. Burchett

and

Robert L. Jensen

This work is accepted as fulfilling
the research paper requirements for the
degree of

MASTER OF SCIENCE

IN

MANAGEMENT

from the

United States Naval Postgraduate School

TABLE OF CONTENTS

SECTION	PAGE
Introduction	1
I. What is Reinforcement	4
Lesson Plan	9
II. Shaping and Maintaining Operant Behavior	13
Lesson Plan	16
III. Schedules of Reinforcement	20
Lesson Plan	25
IV. Conditioned Reinforcement	32
Lesson Plan	35
V. Negative Reinforcement (Aversive Stimuli)	40
Lesson Plan	43
VI. Individual and Group Control	50
Lesson Plan	52
VII. Summary	56
Lesson Plan (By Products of Excessive or Inconsistent Control)	59
Glossary	62

ABSTRACT

Experiments have been conducted in the reinforcement of human behavior for many years. Yet, despite its proven potential, few utilizations have been made of the results available in the motivation of subordinates. This paper is the result of a collection of raw data from texts, experiments, periodicals and interviews with prominent personages in the field of psychology, education and industry. The data has been condensed into a recommended course for industrial education of all levels of management. It is presented in lesson plan form with supplementing notes to the instructor on the broad areas of response reinforcement. Particular emphasis has been placed on making management aware of the potential of response reinforcement, on the mechanics of utilization and upon expected results from various techniques available.

TABLE OF CONTENTS

SECTION	PAGE
The Problem.	1
Assumptions	2
Method of Attack	2
Review of the Literature	3
Proposed Solution	4
Limitations	5
Bibliography	6
Appendix	
Introduction	1
What is Reinforcement	4
Shaping and Maintaining Operant Behavior	13
Schedules of Reinforcement	20
Conditioned Reinforcement	32
Negative Reinforcement (Aversive Stimuli)	40
Individual and Group Control	50
Summary	56
Glossary	62

The Problem

The United States has long enjoyed the reputation of being the most productive and industrialized country in the world. This reputation has been earned almost entirely via advanced technology and research. There is no question that industry in the United States is more capable of mechanizing than any other country. Recent history indicates that the United States may have reached the point of diminishing returns when attempting to increase production efficiency exclusively through advanced machine technology. The problem becomes more important when we consider the higher rate of growth that other industrial nations have recently enjoyed compared to the United States. This, plus the fact that the national government is extremely concerned about the balance of trade and the resultant gold flow, dictates that industry must become more efficient to enable the United States to remain truly competitive. The national concern mentioned above is exclusive of the obvious necessity of individual firms being efficient for competitive reasons.

Despite industry's constant search for increased efficiency in production, it apparently has overlooked a large area of potential in increasing efficiency. Regardless of the number and quality of machines employed, every product requires employees. The efficiency of employees is directly related to the efficiency of production. Current management practices towards increased efficiency of employees has been almost exclusively concentrated in the area of monetary remuneration. This practice is prevalent in industry despite psychological experiments which indicate that money as a motivator and reinforcer for employees is not always the most effective.

When investigating the utilization of response reinforcement in industry it was found that most industries were not aware of its potential. Those that do utilize it have done so in a limited manner. Every firm visited demonstrated interest in the potential of response reinforcement but expressed a dislike for the number of texts and reports that were required to allow understanding of its principles.

Assumptions

All organizations concerned with profitable operations are constantly striving for more efficient methods of production and operation. Any new method of improvement in efficiency, either proven or theorized, would be reviewed for applicability. The average corporation always attempts to minimize the expense of long schools associated with instructing new ideas, methods and theories of management. Therefore, information will be more favorably received if it is in a condensed, accessible and easily presentable form. It is further assumed that individuals and organizations do strive for improvement but they desire the information in a condensed form without the necessity of exhaustive and time consuming research.

The general assumption is that management would utilize response reinforcement if information on the subject were available in a condensed form adaptable to the mode of instruction presently being utilized in educating management personnel.

Method of Attack

The approach to consolidating information and encouraging the utilization of response reinforcement was simplified in that there was no concept to develop. The first step was to consolidate available facts pertaining to response reinforcement. These facts were obtained from existing volumes pertaining to psychology and applied experiments in reinforcement theory. Once the facts were gathered, they were then divided into broad divisions of the subject. Prominent personages in the fields of education and business were consulted to discuss the proper approach for presenting the data that had been collected. The decision was made that the information alone would not suffice and therefore an optimal method must be devised to present the information in a ready to use form.

After collecting the information and having decided upon a method of presentation, opinions as to the applicability and content of the subject were sought. In this endeavor, recognized experts in the field of psychology and management were consulted for their reaction to the project and for suggestions of improvement. After being assured that the subject would be acceptable to management and was in an acceptable educational form, the

information was transcribed into print for distribution.

Review of the Literature

It became apparent, in the initial phase of research of response reinforcement, that material available consisted of numerous volumes pertaining to psychology, in which response reinforcement occupied space ranging from one paragraph to several chapters. Although texts and articles were utilized for background and general information, the primary attention of the course was directed toward three texts and an experiment in manipulating human behavior.

Personality, An Experimental Approach, by Robert W. Lundin, is being utilized as the basic text for the course. It is felt that this text covers the subject more comprehensively than any other text, yet remains readily understandable to the layman. Attention is directed toward experiments with animals but more stress is placed on techniques of human manipulation with numerous common examples of reinforcement potential. This text was exceptionally valuable in defining and explaining intermittent reinforcement.

Science and Human Behavior, by B. F. Skinner, is being utilized as a secondary text and general reference book for the course. It is easily readable and comparably comprehensive on response reinforcement. This text directs considerable attention to the salesmanship of the subject and to the question of morality that arises over society and individual's rights to control the behavior of other individuals. Experiments with animals are examined in great detail. This text corresponds to the basic text in most general theories and many of the chapters have similar methods of presentation.

The Analysis of Behavior: A Program for Self Instruction, by James G. Holland and B. F. Skinner, has been utilized as a workbook. It is, as the title indicates, a self instruction course that covers basic psychology. It stresses definition of technical terms and is particularly adaptable to the individual's rate of learning.

Principles of Psychology, by Fred S. Keller and William N. Schoenfeld, was utilized to provide general background information. Although this text is comparably older than the other texts utilized, it remains one of the better texts for supplying readily accessible material of a general nature

in psychology.

Articles were taken from numerous psychological periodicals including the Psychological Bulletin, Journal of Experimental Psychology, and the Journal of Comparative and Physiological Psychology. One article in particular, "Experiments on the Alteration of Group Structure," in the Journal of Experimental Psychology, January 1965, was utilized quite extensively in the course as a means of demonstrating the potential of response reinforcement and in promoting the acceptance of its theories. When we interviewed Dr. Bavelas, he indicated that this experiment was the first of a planned series in this area.

Of the remaining books in the bibliography, it is felt that the following provide the most pertinent information on the subject: Schedules of Reinforcement, by C. B. Ferster and B. F. Skinner, The Psychology of Learning, by B. R. Bugelski, and The Motivation of Behavior, by Judson S. Brown.

Proposed Solution

The proposed solution to the problem of making industry aware of the potential of response reinforcement, to provide an expedient method of instruction, and to create interest in research of response reinforcement is the resultant suggested training program in Appendix I of this paper. Appendix I includes eight areas of study in response reinforcement in lesson plan form. The lesson plans have been derived from highly recommended texts on the subject area. Each lesson plan is preceded by a "note to the instructor" on the respective area of the subject matter. The instruction amplifies the lesson plan by explaining major areas to emphasize in the formal presentation plus related information taken from experiments and texts not specifically utilized in the lesson plan.

This program was designed to accumulate pertinent facts on response reinforcement in one paper and present them in an educational format that could be utilized at various levels of management. The program, as designed, may be utilized for self improvement of an individual by studying the "notes to the instructor" plus the respective lesson plan. The program can be utilized for an indoctrination course for executives, to make them aware of the potential and mechanics of response reinforcement by condensing the lectures and not requiring completion of the text assignments. It can also be utilized as an intensified course by providing text books for

the class and requiring completion of assignments in each area of study.

Limitations

This study was undertaken in the interest of providing management at all levels with an effective tool which could be utilized to provide a more effective organizational work unit. However, the admonition that "a little knowledge can be dangerous" must be applied to the results of this paper. For a person to be considered as an expert in the field of reinforcement and the conditioning of human behavior, much study beyond the limits of this presentation, or any single contribution in the field of human behavior, would have to be undertaken. It is felt that study of this program, plus recommended source material, should enable persons interested in shaping human behavior to obtain a more clear conception of the many areas involved and of an awareness of the concepts they must utilize efficiently in directing human effort through completion of the defined objectives.

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APPENDIX

INTRODUCTION

The intent of this effort was to take material from the works of various psychologists who have written about response reinforcement, and combine this information into a form more easily studied by the layman with an interest in improving his knowledge of the behavior of humans and the methods of effectively manipulating their behavior into desired channels. Though primarily interested in condensing the information gathered into one source, it was realized that to lift the material completely out of context would not be practical. To avoid the possible confusion of taking information from context, a list of references is included for future study.

It is intended that after completing study of this material, the reader will have a more workable knowledge of the types and methods of response reinforcement and the results to be realized from effective utilization of the various reinforcement techniques. The reader should realize that this information will not make him proficient in the field of psychology, but hopefully will provide a better understanding of the area of reinforcing personnel and the associated conditioning of behavior resulting from these efforts.

To provide adequate reference material for the interested person, three texts have been selected which give an excellent coverage of reinforcement, yet are very readable by the layman. References are made in the lesson plans to direct the reader to areas of the texts covering specific points presented. This program has been constructed about three books to provide the user with reference material for further study.

The books utilized are:

primary text (I)	<u>Personality, An Experimental Approach</u> , by Robert W. Lundin.
secondary text (II)	<u>Science and Human Behavior</u> , by B. F. Skinner.
workbook	<u>The Analysis of Behavior: A Program for Self Instruction</u> , by James G. Holland and B. F. Skinner.

Social behavior comprises the stimulations and reactions arising between an individual and his fellowmen. Social stimuli do not differ from other stimuli in their dimensions but there is a difference in their origin. They arise from other organisms, their behavior, or the products of their behavior. It will help to remember that sub-human organisms, no less than man, exhibit social behavior. From them we may learn many lessons which will enable us to observe man's activities in a more objective light.

The average person is constantly discovering that many of the terms and concepts used every day by people have been taken out of the "common sense" category and put into scientific terms by those studying the world about them. It has been so with human behavior as the social psychologist has struggled to answer the ever present questions concerning human behavior. Therefore, much of the material found herein will not be completely unfamiliar regardless of the label placed upon it. The basic reason behind this effort has been to provide a concise and better description of some of the common terms and to elevate this knowledge to an educated plane for more effective utilization.

The following sections contain explanations of the types of reinforcements and the results anticipated in each case. They are, in most instances, amplified with the results of experiments in applied psychology. Following the explanations in each section there will be found suggested lesson plans

for self study or use in personnel instruction.

It is hoped that after study of this material, the increased knowledge concerning response reinforcement will enable managerial personnel to develop a more effective work force through efficient and effective application of timely reinforcement.

SECTION I

What is Reinforcement

A logical question which might be asked by any manager who has attained a degree of success with his employees is, "How can this program really help me?" The answer lies in the degree of productiveness that he has attained through his men. If his personnel have always achieved "ultimate production", the manager admittedly has no requirement for this course. However, if there is an indication that one or more individuals have more potential than they are demonstrating, there is a need for the manager to obtain the skills necessary to apply proper reinforcement so that he can enjoy the resultant increase in productivity.

Effective response reinforcement is a useful tool for implementation by managerial personnel to enhance the opportunity for improving subordinate production. There are many proven theories which show that specific types of reinforcement produce characteristic behavior in both animals and humans. The following experiment, conducted by four psychologists at Stanford University, demonstrates the result of effective reinforcement.

The experimenters (Bavelas, Hastorf, Gross, and Kite) stated in the first sentence of the article, "Experiments on the Alteration of Group Structure", that a fundamental problem in social psychology is the relationship between an individual's behavior and how that behavior is perceived and evaluated by others. A series of experiments were conducted, which attempted to alter the verbal behavior of individuals in group discussion.

Seventy-two male students were gathered as subjects in the start of the experiment and were divided into groups of four. The subjects did not know one another other than the fact they were fellow students. The four-man

groups were placed in rooms for discussion periods with the instructions that they were to study the cases made available to them and discuss the case for a period of time. During this discussion period the subjects were told they would be observed through one-way glass with particular emphasis on discussion group techniques. At the end of the discussion period, the person conducting the experiment re-entered the room and administered a short sociometric questionnaire by which each subject was to rank all group members, including themselves. The key items on the questionnaire were (1) amount of participation, (2) quality of ideas, (3) effectiveness in guiding the discussion, and (4) general leadership ability.

After the first ranking was completed and group had read the second case to be discussed, they were told that on the second trial they would be provided with feedback as to the quality of contributions they were making toward an intelligent solution of the case. No outsiders were in the room, but feedback was provided in the form of green lights for approval and red lights for disapproval. When a contribution was made, (silence, idea, agreement with another speaker) the appropriate light would indicate to the individual the evaluation of his contribution. The lights for each subject were recessed into the desk in such a manner that no subject in the room could see another person's light.

The experimenters then had the group commence a 20 minute discussion of the second case. During this discussion period, an experimenter charged with the operation of the lights, began to provide the lowest rated subject from the first discussion a "healthy dose" of green lights and provided the remaining members of the group red lights when they disagreed with the selected subject and green lights when they were in agreement.

Following this discussion period the group ranked themselves by the

same sociometric questionnaire that had been used following the first trial. Another case was then discussed under the same conditions as the first trial. Following the third case discussion, the group members were asked to state which of the cases they enjoyed the most and which they enjoyed the least.

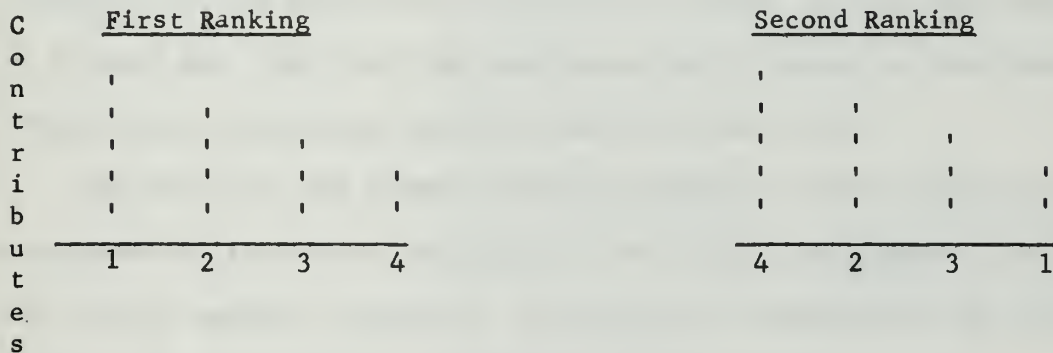
The results obtained from this series of studies were very interesting. The self ranking following the first case clearly categorized the individuals into four distinct levels, one, two, three, and four, with number one being the best contributor and number four contributing the least. In the second case, in which the number four man was reinforced with green lights, the self ranking indicated in nearly every case that the number four and number one subject had switched positions. Following the third test, the ranking was identical with the second ranking. In other words, the experimenters had changed one subject's attitude and performance and had also changed the other group members' opinion of the subject's performance. All of this was achieved by controlling, (with a simple light bulb) the type and kind of reinforcement administered. The same result was obtained from identical experiments with many different groups and the change in rank persisted until another reinforcement was applied.

The same basic experiment was performed with other subjects in which the method of feedback was varied. When the feedback was controlled by pre-set means (a timing device which altered the lights in a random pattern), there was some change in ranking and reaction but it was not necessarily a constructive change. During the experiment it was found that to provide the selected low subject with all green lights and to provide the other members with all red lights did not produce a desired result.

During post session questioning, it was further determined that the

subjects who had been manipulated through the "high diet" of green lights had a constant preference for the second case and stated a marked increase of enjoyment in the second discussion. No such preference was stated by those not selected for extra reinforcement.

The following graphs represent the results of the ranking questionnaire following the first and second discussion.



Individuals

The results of the changes in the ranking of subjects two and three was not always noticeable nor considered pertinent to the experiment. The lowest ranked subject in the original test was utilized to provide a reference from which significant noticeable alterations in behavior could be measured.

This experiment was published in the Journal of Experimental Psychology, Volume 1, Number 1, January 1965, under the title "Experiments on the Alteration of Group Structure".

It is felt that this particular experiment best demonstrates the potential of response reinforcement. People, and the behavior of people, can be made to change as a result of reinforcement. In this experiment, the behavior of one person was changed from a relatively quiet participant to an aggressive personality that tended to lead the discussion. A "docile"

individual was made into a productive person by the application of positive reinforcement, (green light). The important lesson is the fact that the reinforcer was applied by a thinking organism and not merely the results of chance. It was intelligently applied at the optimum time and in the correct manner. The experimenter controlling the lights corresponds to the immediate superior in the daily work situation. He is the person responsible for the morale of the production force. In the final analysis, he is much more important than management twice removed up the chain of command when considering employee production and morale.

Not only will the person utilizing effective reinforcement be a better supervisor in the eyes of management, but he will contribute in improving the overall working atmosphere. The subjects reinforced in the second case stated that the second case was more enjoyable than the first.

It is recommended that the instructor conduct this experiment at the beginning of the course when conditions permit, and when they do not, he should explain it as a method of motivating interest in the general field.

It should be evident that a clearly defined area exists in which we may maneuver in reinforcing subordinates. Learning this subject will require time and research, but the "payoff" in efficiency is ample reward for the time invested.

It has been said, "When an organism acts upon the environment in which it lives, it changes that environment in ways which often affect the organism itself."

TITLE:

WHAT IS REINFORCEMENT?

OBJECTIVES:

- A. Acquaint the class with reinforcement.
- B. Acquaint the class with the potential of reinforcement.
- C. Encourage the class to utilize reinforcement as a management tool.

INTRODUCTION:

- A. It is generally recognized that the employee seldom works "just for money". The employer who relies strictly on monetary remuneration provides an advantage to competitors that reinforce employees with response reinforcement.
- B. Any person who utilizes reinforcement effectively must understand its utilization in everyday situations. He must be aware of the types and mechanics of reinforcement available. Mention will be made of the areas of reinforcement within the economy and how they affect almost every aspect of life.

PRESENTATION:

- A. The average worker is reinforced in his work in many ways.
 - 1. Individual craftsmen are reinforced by:

Text II, 390

- a. money
 - b. success in dominating the industry
 - 1. quality
 - 2. amount of production
 - 3. demand for product
- 2. The worker who "likes his job"
 - a. has little absenteeism
 - b. changes jobs very seldom
 - c. is more productive
- 3. If he works under aversive stimuli (negative reinforcement)
 - a. whole task is aversive
 - b. will be absent or change jobs if economic conditions permit
 - c. excessive sickness, unemployment, disruptive behavior are many times traced to aversive stimuli

Text II, 394

4. Mass production is placing more stress on economic reinforcement because of the inability of reinforcement in other areas.
- B. People evaluate reinforcement in every decision.
 1. Worker accepts or rejects offer of a job.
 - a. compares positive and negative reinforcements on the job
 2. Employer has same decision as 1.
 - a. must give up goods or money which reinforces him, this makes it aversive to the employer.
 3. When sale is made.
 - a. quickly
 1. object purchased is highly reinforcing
 - b. long deliberation
 1. positive and negative reinforcers more evenly matched
 4. Reinforcement values vary with level of deprivation
 - a. hungry man will pay more for food
 - b. price may be manipulated by manipulating the supply of any good
 5. History of reinforcement of the person making the decision
 - a. when reinforcement to the buyer exceeds aversive consequences of giving away the money.
 - b. "learning the value of a dollar" is knowing aversive consequences of parting with a dollar
 6. Merchandising technique.
 - a. article made attractive by package design, reinforces upon sight

7. Imitative behavior

- a. testimonial advertising
- b. "keeping up with neighbors"

8. Time elapse

- a. immediate delivery encourages sales
- b. manipulate time with credit (don't give up money immediately)

Text II, 396

9. The greater the reinforcement effect of the object, the more often reinforcement may fail to materialize and the person will continue to buy.

C. Gambling, an example of reinforcement theory.

1. Probability man will bet specific amount varies due to history of reinforcement; the probability of his continuing to bet depends upon schedule of reinforcement.

Text II, 397

2. Gambling devices generally observe a variable-ratio schedule.

- a. if house collects too much yield, large profit - loss of players
- b. if house collects too low yield, low profit - many players
- c. optimum is to start low yield and increase

3. Gambling devices make effective use of conditioned reinforcers.

- a. slot machine pays off generously for jackpot "three bars", this makes two bars and anything else very reinforcing since "almost hit" (no cost to the owner)

SUMMARY:

The probability that a transaction will take place is a function of the levels of deprivation of buyer and seller, upon the temporary characteristics of the object or situation involved in merchandising, upon the behavior of others similarly engaged, upon the contingencies which decide the form of receipt of goods or giving up of money, and upon a history of the schedules of reinforcement.

The layman refers to reinforcement as rewards for much activity. Regardless of the name applied, it is an

extremely effective method of controlling behavior through the desired goal. This course will make you aware of reinforcement, enable you to recognize it and introduce you to the many methods that may be utilized in applying it. There will be material on both the advantages and disadvantages. Hopefully, at the completion of the course you will recognize reinforcement, know how it is utilized, know how to apply it, and realize the many areas of inefficient utilization that could easily be improved.

SECTION II

Shaping and Maintaining Operant Behavior

When an organization strives to reach a goal, through the use of personnel, there has to be an incentive for the production force to continue its efforts so the organization may exist in the competitive world and realize its stated profit objectives. These incentives are most commonly regarded as being monetary in nature. However, there are reasons other than money which determine the average man's motivation for remaining on the job.

Almost every one connected with the study of human behavior recognizes there is a hierarchy of needs which give rise to those drives present in each person. In our society the most basic of these needs, hunger, thirst, safety, etc., are satisfied. This leaves the two intangible needs which may be manipulated in order to shape human behavior. These are the needs for recognition or approval and for self actualization.

The need for self actualization may be satisfied without assistance from sources outside the mind of the individual concerned. The other need is very susceptible to human influence, however, and is dependent on the reaction of peers and superiors. One of the fundamental problems in our society is the relationship between individual behavior and how that behavior is perceived and evaluated by others.

With the current reduction in the manner by which people can be provided with incentives and motivation, it is essential that the manager take advantage of every chance possible to provide drive to the work force. One such way is through the individual's need for recognition and approval of his behavior and his efforts.

One manner of encouraging personnel is by rewards for their efforts or what we call reinforcement for their responses. Proper applications of reinforcement will enable the shaping of behavior through the subject's willingness to repeat the act for which he was rewarded. Timeliness of the reinforcer will enable the duration of the response learned to vary according to the desires of the person who bestows the reward. Certain methods of reinforcement will produce characteristic results which may be varied as the situation demands.

Operant behavior conditioning can be very effective and the conditioning may be accomplished without the express knowledge or awareness of the action by the subject. To be most effective, the reinforcer must be applied immediately following the response to be shaped. There can be unfavorable results when the delay between the response and the reinforcement is excessive. The reinforcement may be of a positive or negative nature and composed of a variety of methods ranging from continuous to none. The types of reinforcement techniques are essentially different in the schedule and manner of application to the subject.

There are certain advantages to using each type of reinforcement. Continuous reinforcement produces a faster learning rate but is conducive to more rapid extinction of the response and an increased tendency toward discouragement when the reinforcer is withdrawn. Intermittent reinforcement varies according to the schedule prescribed but has the advantage of prolonging the extinction process for the learned response. Secondary reinforcement may be the most subtle of all, particularly in regard to the subject's awareness of the action. However, experiments have shown that in the extinction process the presence of secondary reinforcement during the learning process, with primary intermittent reinforcers, has tended to

prolong the learned response in the subject.

When the reinforcement is administered at a regular interval, such as paydays, the activity of the personnel increases as the reward period approaches. There is a noticable variation in human behavior according to the type of reward schedule administered. This is the primary reason for understanding the concept of response reinforcement and associated reactions of the subjects. Many firms provide their personnel with pay or bonuses on a piecework basis which is nothing more than a method of ratio reinforcement.

It has been shown in actual practice that a schedule of reinforcement, properly selected and applied by management, can increase productivity, personnel interest, morale, and contentment. These items should be of paramount concern to the manager charged with producing profits for his organization.

TITLE:

SHAPING AND MAINTAINING OPERANT BEHAVIOR

OBJECTIVES:

- A. To explain some of the mechanics of reinforcement.
- B. To correlate some of the animal experiments with human actions.
- C. To establish a basic knowledge of reinforcement theory from which to build the remainder of the course.

INTRODUCTION:

- A. To obtain desired end behavior from an individual through response reinforcement can be compared to the sculptor's problem of obtaining a shape from a lump of clay.
- B. Obtaining a complex end result from a human could be compared with trying to make a bird peck a given spot. We could not sit and wait for the bird to peck the spot and then reward it. This would be too time consuming. We first reward the bird when it turns in the right direction. This increases the frequency of this response. The food is withdrawn until the bird moves closer to the spot. This step is repeated until the bird is at the spot, then food is only given when the bird hits the spot. This shaping of behavior can be accomplished in a short period. Our task today is to learn the mechanics of reinforcement that will produce the desired result in human behavior in the most efficient manner.

PRESENTATION:

- A. Reinforcement in humans.
 - 1. If we wait for a single complete instance we reinforce the complete cycle but in a far less effective manner.

Text II, 92

- a. depending on the desired task we may have to take maturation into consideration.
 - b. child learns to raise himself, stand, walk, grasp objects and to move about by being reinforced in instances of slightly exceptional merit.
- 2. Response generalization (transfer).
 - a. in reinforcing one action we often increase the strength of another.
 - b. success in one field may increase the tendency to be active in others.

Text II, 94

B. Operant reinforcement in acquiring behavior (knowing how to do something) and how it is refined (doing it well).

1. Reinforcement that develops skill must be immediate.
 - a. quick report of accomplishment.
 1. rifle shoot
 2. bowling form
 3. sealegs
2. Above is differential reinforcement as each of the results can be compared with previous results and improvement reinforces the correct form, etc.
3. Verbal response are reinforced with same technique.
 - a. indulgent parent may reinforce "baby talk" into adolescent or adult years, but eventually the average listener will not accept nor reinforce it, so it is stopped.
 - b. mother who complains about three year old's whines and cries for attention may not realize her own reinforcing practices are responsible.
 1. she is busy and doesn't answer normal voice.
 2. answers louder voice.
 3. adapts to new level so child raises volume again

C. Types of reinforcement.

1. Usually behavior which acts upon the immediate physical environment is consistently reinforced.
 - a. reach for articles.
 - b. see ourselves in mirror.
 - c. lift objects.
2. A large part of behavior is reinforced only intermittently.
 - a. don't win at cards every time.
 - b. don't always find good ice or snow for winter sports.
 - c. don't always eat well (reinforcements of education and industry are almost always intermittent because it is not feasible

Text II, 99

to control behavior by reinforcing every act).

3. Intermittent reinforcement.

- a. resultant behavior remarkably stable.
- b. high resistance to extinction.
- c. continuous reinforcement never compares with intermittent in a. and b.
- d. technique for getting more responses per given number of reinforcements.

Text II, 100

4. Interval reinforcement--reinforce behavior at regular intervals--animals will adjust with a constant rate of responding. If every minute, they respond at a fast rate, if every five minutes, they will respond slowly.

- a. how often we call a given number depends on how often we get an answer.
- b. size and amount of reinforcement affects the rate (larger the reinforcement--more the responses).
- c. slight delay between response and reinforcement lowers over-all rate.
- d. degree of deprivation and satiation also affect the rate.

5. Variable-interval reinforcement.

Text II, 105

- a. used to eliminate slight slack time immediately following reinforcement in interval reinforcers.
- b. pigeons have been observed to respond for 15 hours at rate of 2 to 3 times per second without pausing over 20 seconds at one time.
- c. details will be described in the next lesson.

6. Ratio reinforcement.

- a. generates a very high rate of response provided the ratio is not too high.
- b. a variable ratio reinforcement is much more effective at producing high response rates than the ratio alone.
- c. this and all of the other common schedules of reinforcement will be explained next lesson.

SUMMARY:

- A. Optimal schedules of reinforcement are of great practical value. They are often utilized in connection with other variables which affect the rate. Reinforcing a man with \$50.00 at one time may not be as effective as reinforcing him with \$1.00 fifty times. There are also subtle interactions between schedules of reinforcement and levels of motivation, immediacy of reinforcement, etc.
- B. Many unions have gone on record as being against some of the high rate producing schedules of reinforcement. However, it has been proven that a schedule of reinforcement not only increases productivity but it also increases interest, morale, and contentment of the worker.

SECTION III

Schedules of Reinforcement

It has been established through innumerable experiments and observations that all organisms perform much more effectively when rewarded for their efforts. The greater the effort required, the more substantial the reinforcement that is required. The threat of punishment for neglecting work or for improper performance is effective only to the extent that the minimum amount of work will be performed necessary to avoid punishment. Therefore, if we as supervisors can effectively substitute response reinforcement for the punishment threat, we can improve employee performance while establishing a "good" place to work.

The first type of reinforcement considered is continuous reinforcement. While this type may seem to be the most logical, particularly on employee morale, it has undesirable characteristics which should be avoided in the interest of the organization.

Continuous reinforcement is the act of reinforcing every response. While this might seem reasonable in controlled situations or experiments, it is extremely difficult to apply in the every day world. It is possible to approach such a high rate of reinforcement that it may be considered as being continuous. The constant smile, the instant recall of the individual's name and business, the frequent pat on the back, or the complete lack of any sign of disapproval with the efforts of the subject are all examples of continuous reinforcement.

One aspect of continuous reinforcement that is most desirable is the short period the subject requires to acquire a new response. The learning rate is speeded up under continuous reinforcement. While this is desirable,

it can be repeated so many times that the benefits realized at the beginning may actually become an expense in future responses.

Abram Amsel reported in the results of one of his experiments "The Role of Frustrative Non Reward in Non Continuous Reward Situations", Psychological Bulletin, 1958, about the difference in response by white rats when they were subject to non-continuous reinforcement after being rewarded on a continuous basis. The subjects were trained to run down one runway to a feeding box for a reward and then down a second one for another reward of food. Their efforts were observed until the average time to make the trip had been stabilized for each subject. The food was then omitted in the first feeding box for some of the subjects and continued for the remainder. There was a marked increase in the vigor displayed by the subjects that had not been reinforced in the first box when they started down the second runway. The animals that received reinforcement in the first box were much more complacent on the second runway. Another significant difference was that as the length of the first runway was increased, the vigor displayed on the second runway increased more extensively following non reward.

The implication drawn from this work is where there is continuous reinforcement, there is a stabilization of drive and energy below that which the subjects are capable. There was also a tendency toward accelerated extinction of the response for which the reinforcement was continuously applied. This factor should be considered after determining whether the goal desired is one of quick learning or extended retention or an optimal mixture of both qualities.

To develop a program of continuous reinforcement for the express purpose of speeding up learning would necessitate a parallel program of another type reinforcement. Intermittent reinforcement should be utilized to ensure

some retention after the initial acquisition of the desired knowledge had been completed.

In general, it has been found that utilization of continuous reinforcement resulted in faster learning rates at the expense of more complacency during later trials. The continuously reinforced person does not retain the skill as long and is more likely to become discouraged in the face of adversity. If the person exerting control is aware of the advantages and disadvantages of continuous reinforcement he will find it is an extremely useful managerial tool.

For a given situation, the degree of extinction obtained during a fixed amount of time has normally been found to be dependent on the amount and type of reinforcement gained during the acquisition period. As indicated above, continuous reinforcement has the disadvantage of quick extinction. For this reason a substitute type reinforcement, or a complementary type, must be associated with continuous reinforcement during acquisition.

Intermittent reinforcement is defined as that reinforcement provided at intervals of time, regular or irregular, or it may be dependent upon the number of responses made by the subject. Intermittent reinforcement has the characteristics of a slower learning rate than might be found in continuous rewards, but the period of time required for the extinction of the learned response is of a longer duration. This extinction may be prolonged even more with the inclusion of conditioned reinforcement during the learning period.

The concept of intermittent reward was reported by Harriet Linton and Neal Miller in their article, "The Effect of Partial Reinforcement on Behavior During Satiation" appearing in The Journal of Comparative and Physiological Psychology, 1951. During their experiment, it was found

that the subjects who had been intermittently reinforced exerted more effort during the extinction period and took more trials to reach the extinction criteria than did those subjects who had been continuously reinforced during the learning period.

In the book, Deterrents and Reinforcement, Lawrence and Festinger stated, "The experimental data, on the other hand, indicated that....a partial reward schedule established a stronger performance than did continuous reward when response strength was measured by resistance to extinction". In the Weinstock experiment described by these authors, the least rewarded of four experimental groups exhibited the most resistance to extinction. It is important that it not be inferred that the fewest possible reinforcements always produce the desired condition. While one given experiment might tend to demonstrate this, another will show the same results in a different light.

John Hall, of Ohio State University, conducted an experiment from which he concluded that the number of correct responses in a given situation was dependent on the frequency of primary reinforcements. Thus, while the resistance to extinction increases as the intermittent reinforcements decrease, learning seems to increase as the frequency of primary reinforcements increases. It would seem then, that there is a point where both learning and resistance to extinction would be optimized for a given frequency of reinforcements. The optimum mix of these two and the desired range are unknown for every situation but continued effort and experimentation should develop methods which will produce the desired results in specified situations.

Intermittent reinforcement apparently is management's answer to the problem of shaping and maintaining behavior in personnel. Possibly the

most difficult aspect is the determination of the correct amount of intermittent reinforcement to bridge the gap between insufficient and continuous rewards.

TITLE:

SCHEDULES OF REINFORCEMENT

OBJECTIVES:

- A. Acquaint the class with schedules of reinforcement.
- B. Motivate the class to further research.
- C. Acquaint the class with optimum schedules for various desired behavior traits.

INTRODUCTION:

- A. Establish Contact.
 - 1. 95% time spent in human relations.
 - a. superiors
 - b. subordinates
 - c. contemporaries
 - 2. All under 1 require reinforcement.
 - a. chief to seaman
 - b. chief to chief
 - c. chief to junior officers
 - d. chief to senior officers
 - 3. Reinforcement is a tool for all relationships.
 - a. several techniques of reinforcement (each technique has advantage in particular situation)
 - b. objective is to utilize correct technique at opportune moment

PRESENTATION:

- A. Continuous Reinforcement.
 - 1. Definition: Those procedures in which reinforcement is provided every time the subject responds.
 - a. close window, cut down noise
 - b. work for pay
- B. Intermittent Reinforcement.
 - 1. Definition: reinforcement provided at intervals of time, regular or irregular, or dependent upon number of responses.
 - a. requests not always granted
 - b. phone calls not answered
 - c. autos that do not start
 - 2. Types of intermittent reinforcement.
 - a. fixed-interval schedules (FI)

Text I, 76

- b. fixed-ratio schedules (FR)
- c. variable-interval schedules (VI)
- d. variable-ratio schedules (VR)
- e. rate conditioning
- f. combined schedules

3. Fixed-interval schedules (FI).

Text I, 77

- a. Definition: reinforcement presented for the first response that occurs after a prescribed interval of time from the last reinforcement.
 - 1. example: rat under (FI) of one minute is not reinforced for any number of responses during the minute immediately following last reinforcement -- would be reinforced for the first response after the one minute interval.
 - 2. intervals vary.
 - a. seconds, minutes, hours, days, weeks, months.
 - 3. much behavior reinforced this method.
 - a. attend classes
 - b. eat
 - c. work at given time
 - 4. results of (FI) reinforcement.
 - a. subject develops a time discrimination
 - b. responses slow between intervals
 - c. response become most pronounced at beginning of next interval
 - 5. extinction under (FI).
 - a. smooth and regular rate
 - b. more resistant than regular or continuous
 - 6. conclusions on FI.
 - a. work harder on payday
 - b. absenteeism less common on payday
 - c. study before exams
 - d. (1, 2, 3,) more pronounced if no other reinforcement

- e. consider shorter pay periods
- f. more quizzes spread out
- g. good technique to produce concentrated responses
- h. strong indoctrination will produce persistent behavior in face of adversity

4. Fixed-ratio schedule (FR).

Text I, 83

- a. Definition: Response is reinforced only after being emitted a specified number of times.
 - 1. 6 to 1 - subject provides 6 responses to receive reinforcement on following response
- b. ratios vary.
 - 1. start with low ratio
 - 2. extremely high ratios can be achieved - 500 or 1000 to 1
- c. examples of human behavior.
 - 1. piece rates
 - 2. paid on commission
- d. results of (FR).
 - 1. higher rates of response than FI or continuous
 - 2. break after reinforcement followed by rapid rate
 - 3. subject never reinforced for response immediately following last reinforcement
- e. extinction under FR.
 - 1. when occurs it is sudden and relatively complete.
- f. conclusions on FR.
 - 1. work harder for relatively short periods of time
 - 2. discourages gold bricking
 - 3. protects employer against unsuccessful employee
 - 4. extremely effective if ratio is not too high

5. if ratio high - long break before initiating next response
6. care must be taken in selecting reinforcement of enough value to subject

5. Variable-interval schedules (VI).

- a. Definition: Same as FI only interval varied about given time value.

1. Example: 5 min. VI - reinforcement provided for first response following an interval, with a mean of 5 min., from the last reinforcement. If interval for the first was 4 min., 2nd was 6 min., next would be 5 min.

- b. examples of human behavior.

1. coed dating.
 - a. popular (low interval)
 - b. unpopular (high interval)

2. social behavior
3. hunting and fishing

- c. results of VI.

1. steadiness of rate (30,000 responses in 15 hours from pigeons)
2. higher rate of work obtained than from FI
3. VI seems to "keep subject going" in face of failure
4. steady pace is obtained from this type reinforcement

- d. extinction under VI.

1. slow to take place
2. similar to FI
3. early continuation of learned behavior
4. behavior slows ~~over~~ long period of time

- e. conclusions on VI.

1. industry pays on FI even though VI might increase productivity (Christmas bonus)

Text I, 87

2. VI generates higher rates than FI (number of reinforcements being constant)
3. good for obtaining constant behavior over long periods with little reinforcement.

6. Variable-ratio schedule (VR).

Text I, 90

- a. Definition: Number of response required to obtain reinforcement varies around an average
 1. example: slot machine, reinforcement not achieved without so many responses (plays)
- b. ratios vary.
 1. very low-very high
 2. pigeon 110 to 1 with no variance
- c. examples of human behavior.
 1. gambling devices
 2. education (raise hand to answer question)
 3. plugger - try, try again
- d. results of VR reinforcement.
 1. steady rate without breaks
 2. extremely high rates may be obtained if initial ratio is small
 3. VR yields higher rates of response than VI
- e. extinction under VR
 1. characteristic of FR
 2. sustained run of responses
 3. runs separated by pause
 4. pauses become longer and rate diminishes
 5. contrasts with VI when continuous decline from original rate to extinction
- f. conclusions on VR
 1. extremely high rates may be generated
 2. high degree of control (compulsive gambler)
 3. schedule itself is the reinforcer (in gambling this is chance)

7. Rate conditioning

Text I, 93

- a. Definition: Variations of the ratio schedules previously discussed.
 1. example: reinforcement depends upon attainment of responding either higher or lower than previous specified rate.
- b. rates
 1. higher
 2. lower
- c. examples of human behavior
 1. teaching small lessons at beginning, more as term progresses (languages, apprenticeships)
- d. results of rate scheduling
 1. higher and higher rates of responding
 2. possible to get subject to his limit (fast as he can)
 3. unscrupulous employers can take advantage of it to demand more and more from their employees
- e. extinction under rate scheduling
 1. low rates possible by spacing reinforcement intervals further and further apart (this results in slower and slower responses)
 2. if placed too far apart, will lead to extinction due to lack of reinforcement
- f. conclusions on rate conditioning
 1. people who apply only skimpy reinforcement in infrequent manner are actually applying differential low rate reinforcement thus they generate lower rates of activity and low morale

8. Combined schedules

- a. Definition: All mentioned previously combined in various schedules, alternate (multiple schedules) or operate simultaneously (concurrent)

1. example: ratio and interval schedules will operate so that reinforcement depends on time interval followed by a ratio schedule

b. examples of human behavior

1. selling insurance paid weekly salary regardless of sales, then shift to commission basis to make more money. (mixed schedule)
2. auto salesman paid regular salary plus commission on every car over base number (concurrent)
3. eat, sleep, do assignments on FI, and in some seminars do term papers on ratio schedule

Text I, 95

SUMMARY: In general a high rate of response will be obtained when using ratio schedules. Low and stable rates are obtained from interval schedules. Interval schedules normally produce smooth extinction curves.

Superstitious reinforcement is reinforcement that by chance occurs at the same time a certain response was made, thus the response is reinforced and will be repeated in the future.

SECTION IV

Conditioned Reinforcement

In many instances, the best intentioned manager will not be able to provide a specific type of primary reinforcement to his personnel. There is always a considerable amount of work completed simply because there was a need for the accomplishment of the task. The supervisor can not always be aware of who performed the job or when the effort was expended. In situations where there is no specific primary reinforcement, the concept of secondary or conditioned reinforcement becomes apparent.

Conditioned reinforcement is defined as --

A neutral stimulus, through repeated association with one that is primarily reinforcing, that has acquired the reinforcing function itself.

Referring to the situation mentioned above and the definition of conditioned reinforcement, it becomes apparent that the person who performs tasks expecting no reward might be said to receive pleasure (reinforcement) from the completion of a task. The past presence of the primary reinforcer, in this case praise for a job well done, has produced a conditioned response even in the absence of the primary reinforcer.

In his book, The Psychology of Learning, B. R. Bugelski refers to one of B. F. Skinner's experiments in illustrating this type of response reinforcement. The subjects were animals taught to press a bar in their cage to obtain their food. When the food was no longer provided by manipulation of the bar, the subjects continued to operate the bar for a longer period of time when there was a clicking sound accompanying the operation of the bar.

Another aspect pertaining to conditioned reinforcement was demonstrated

by Professor R. M. Klein of Boston University. The strength of the conditioned reinforcer seemed to depend on the frequency of the primary reinforcer associated with it. Also, the theory that the presence of a conditioned reinforcement tends to prolong the response of the subject during the extinction trials was proven in the same experiment.

The subjects in the experiment were trained to follow a maze to a brightly painted box at the end. Their reward was a supply of food placed in the box. After the training period, consisting of varying degrees of reinforcement for the subjects, the normal straight end portion of the maze was replaced with a "T" arrangement in which the usual brightly painted box was placed at one end of the "T" and a box of a non-descript color was placed at the opposite end. In the results, the strength of the conditioned reinforcement, the bright colored box, increased as the number of primary reinforcements, the food, decreased for the subjects during training. In other words, the more the subjects were reinforced during the training period, the less the color of the box affected their decision as to the direction to turn when reaching the end of the "T" maze.

It must be apparent that the subjects could not be expected to realize that the color of the box had anything to do with their food supply on the first trial. Maybe this would have been learned on other trials, but the idea of the experiment was to determine the effect of the conditioned reinforcer. This idea can be carried over into the human environment with little difficulty.

This more or less sub-conscious conditioning of the response of the subject is evident in many ways in the manipulating of human behavior. It has been utilized in advertising campaigns, is found in the form of music and pleasant pastel color schemes in industrial layouts, and is most commonly used in the presentation of badges, tokens, money, pins, and certificates for achievement awards. This form of reinforcement can bring the

most results for the least amount of physical effort when the program is well thought out and executed. The payoff in personnel conduct might well bring production to a level beneficial to all concerned and more than justify the expense of the program.

TITLE:

CONDITIONED REINFORCEMENT

OBJECTIVES:

- A. Acquaint the class with conditioned reinforcement
- B. Acquaint the class with the types and mechanics of conditioned reinforcement
- C. Demonstrate the potential behavioral control of conditioned reinforcement

INTRODUCTION:

- A. Establish contact
 - 1. A vast amount of human behavior is developed and maintained through the operation of conditioned reinforcers
 - 2. Since the objective of this course is to improve our knowledge of reinforcement and the effective techniques of application it is imperative that we understand conditioned reinforcement
 - 3. A secondary advantage of a knowledge of conditioned reinforcement is that it may make you aware of the reason for the many frustrating actions of your children

PRESENTATION:

- A. Conditioned reinforcement
 - 1. Definition: A neutral stimulus, through repeated associations with one that is primarily reinforcing, that has acquired the reinforcing function by itself.
 - a. example: baby cries due to pain or hunger, mother picks up and comforts, if overdone baby will cry just for reinforcement from attention
 - 2. Principles of conditioned reinforcers
 - a. for stimulus to operate as secondary reinforcer, it must first be established as discriminative stimulus
 - b. neutral stimulus must precede the primary reinforcement to become secondary reinforcer (in experiment when light went on after animal started to eat had no result as opposed to being on before)

Text 1, 128

- c. once stimulus has acquired status of secondary reinforcer it can then reinforce other behaviors not previously associated with the primary reinforcement
- d. strength of conditioned reinforcer depends upon number of times it was associated with primary reinforcer
- e. the greater the reward of primary reinforcement associated with the secondary stimulus the greater the strength of the resultant conditioned reinforcer

3. Types of generalized reinforcers

- a. attention
- b. approval
- c. affection
- d. submission of others
- e. token

Text I, 133

4. Characteristics of generalized reinforcers

- a. generalized because most have similarity in conditioned history
 - 1. similarity of cultural stimuli
 - 2. specified codes of conduct
 - 3. same attitudes
 - 4. same social customs
- b. once established under one behavior they can reinforce others
- c. be aware that reinforcement from the reinforcement from the first four is a direct result of the behavior of the reinforcer

5. Attention

- a. sets the occasion for future activity
- b. many means of application
 - 1. glance
 - 2. wave
 - 3. snap of fingers
 - 4. verbal response

- c. difficult to find point where attention ends and approval begins
- d. many times utilized as condition prior to other reinforcements
- e. develop attention as a reinforcer early in life
 - 1. cry
 - 2. make loud noises
 - 3. ridiculous questions
 - 4. refuse to eat
- a. conditioned reinforcer has become more powerful than the primary reinforcer (hunger)
- b. indication that normal behavior has not been sufficiently reinforced
- c. if extreme attention demanded can result in hypochondriacs, self-centered personalities, etc.
- d. no inherent need for attention

6. Approval

Text I, 137

- a. attention alone is usually insufficient to maintain behavior, approval is another generalized conditioned reinforcer that retards extinction
 - 1. examples: good, fine, that's correct, good job, or any other form of communication that demonstrates approval
- b. approval is more powerful if applied by a group as opposed to an individual
 - 1. attend church regularly
 - 2. accept social engagements
 - 3. dress in prescribed manner
 - 4. purchase the expensive auto
 - 5. lately purchase small foreign automobile
- c. educational process utilizes approval as primary means of reinforcement
 - 1. mark papers, (correct, good, right)
 - 2. provide marks, diplomas, honors
- d. other examples

1. female preening before a mirror for long periods, hoping for approval from escort
2. men trying out in sports
3. keeping up with fads

7. Affection

Text I, 139

- a. of three reinforcers mentioned affection is the strongest. Many characteristics of behavior are developed with reinforcement by affection, however since they are developed during infancy and childhood there is little application available for managing men

8. Submission of others

- a. the reinforcement is provided to the person to whom another is submitting (if a person gives into a bully's demands it only increases the probability of his bullying again)
- b. signs of deference to a superior reinforce the superior
 1. butter up the boss
 2. acting submissive
 3. parent reinforced by helplessness of offspring
 4. train children to be polite to elders because it helps them, by providing them with a powerful reinforcer
 5. much behavior of people in "important positions" is maintained by reinforcement from submission than is maintained by monetary reward
- c. we admire the ambition of people to the degree that we accept submission as a reinforcing agent
- d. those that have been generously reinforced by submission often find it difficult to provide the same type reinforcement
- e. in societies where competition is less effective, the reinforcement by submission fails to operate as effectively as in our culture

9. Tokens

Text I, 144

- a. money, medals, prizes, awards, grades, gold stars, diplomas
- b. the larger the token the more efficient reinforcement (\$5 as opposed to \$1 for the same response)
- c. professional person displays certificates of accomplishment in office for all to see

SUMMARY:

When we speak of reinforcement to the layman, all too often he associates it exclusively with hours of work, amount of pay, and type of work. He feels that these are beyond his capability to change so he feels frustrated in attempting to utilize reinforcement. However, when reviewing the five general reinforcers we note that four of them are directly concerned with the behavior of the immediate supervisor. It is easy to proclaim "there is nothing I can do to improve morale", when after study it is apparent that much can and should be done by every person in management.

You, as leaders of personnel, should be aware of the power of conditioned reinforcement and should practice utilizing the specific methods to obtain the desired goals with your personnel.

SECTION V

Negative Reinforcement (Aversive Stimuli)

The average worker feels that he exists in a day to day situation of no reward or reinforcement (by recognition) for his efforts. Attention received from the supervisors, is normally of the correction or punishment variety. Too frequently this is the atmosphere that working personnel feel they must perform within. As a result performance is stifled by fear of reprisal. All efforts will just be within the lines of acceptability to avoid negative rewards.

In order to create a more beneficial production atmosphere, the threat of punishment should be minimized and the promise of reward for acceptable work should be emphasized. However, occasions will arise wherein the only recourse open to management will be the application of a type of negative reinforcement. It is important that all personnel in supervisory positions understand the full concept of the theory of "aversive" stimuli.

Aversive stimuli is classified as anything that operates to control behavior through annoyances, harassments, and threats rather than by positive reinforcement. There are four conditions that result from aversive stimuli. They are escape, avoidance, punishment, and anxiety. Any and all of these conditions can produce results that are not particularly desirable to the unit or to the individual concerned. The operation of each differs from the others but they all have one thing in common. They are stimuli which have particular noxious qualities.

It has been generally accepted that the least efficient approach to

a selected response is by punishment. Punishment is conceived as something unpleasant, which if made strong enough (and there is no genuine measure) results in cessation of the act or of an attempt to escape the situation. The important aspect of punishment is the discontinuance of the immediate prior act. Normal conditions, under which most supervisors function, force the delay of punishment until such time that the actual aversive stimuli has lost much of its effectiveness. To be the most effective, punishment must follow the undesired act with a minimum of delay.

The effectiveness of aversive stimuli as a means of behavior control is at best questionable. Though a few individuals may learn their "lessons", the generally accepted theory is that the learned response is not forgotten but merely repressed and may appear again at a time when the action is felt safe. The repressing effect is only temporary for responses which may have been previously reinforced and the time required for extinction of the response will depend on the amount of prior reinforcement tendered to the response. Repeaters in penal institutions are a good example of this.

If there is need for negative reinforcement, the stronger the application, within limits, the better for all concerned. Humans are capable of building up a strong tolerance to punishment when it is administered in an insufficient quantity. Regular punishment is much more effective than occasional applications. There must be a high degree of consistency when administering aversive stimuli.

Supervisory personnel continue to use negative reinforcement, knowing that it is not effective, because the manner is simple, immediate, and in most cases gratifying to the person applying it.

An understanding of the complete concept of negative reinforcement will enable more effective application when the situation leaves no other

alternative. Punishment is an after-the-fact management action and, when possible, should be replaced with other types of control.

The information preceding this section should provide managerial personnel with more efficient alternative actions and enable them to develop an effective and reliable personnel force without constant utilization of the negative approach.

TITLE: NEGATIVE REINFORCEMENT (AVERSIVE STIMULI)

OBJECTIVES: A. Acquaint the class with adverse stimuli

 B. Introduce the class to the common types and characteristics of adverse stimuli

 C. Develop the ability of the class to recognize the favorable and unfavorable aspects of aversive stimuli, and how to utilize them effectively

INTRODUCTION: A. Aversive stimuli, negative reinforcement, and the potential behavior it creates, i.e., escape, avoidance and anxiety are areas about which the layman has many misconceptions. This class will attempt to clarify the definitions and make you more aware of problems inherent in the use of punishment and other negative reinforcers.

Text I, 210

PRESENTATION: A. The class of stimuli that operates to control behavior through annoyances, harassments, and threats rather than positive reinforcement is known as aversive stimuli.

Text I, 210 1. Four conditions result from aversive stimuli

 a. escape

 b. avoidance

 c. punishment

 d. anxiety

 1. The operations of each of the above differ but they share one thing in common, a stimulus which has particular noxious qualities (aversive stimuli)

 2. Definitions:

 a. escape: A response is strengthened by the removal of some stimulus

 1. rains outside, step indoors

 2. get shocked, jump away

 b. avoidance: A response is made in order to prevent the onset of a stimulus

 1. stay on straight and narrow (we will keep out of trouble)

 2. once it is learned how to escape from an aversive stimulus it is possible to maintain behavior to avoid recurrence

- c. punishment; Response is followed by a stimulus.
(The effect of stimulus is to depress original behavior on future occasions)
 - 1. unlike escape, where response terminates aversive stimulus and is strengthened -- in punishment, response is followed by stimulus and is depressed
 - 2. child is naughty (behavior) and gets spanked (stimulus)
- d. anxiety: Neutral stimulus is followed by one that is aversive
 - 1. contingency is that subject can do nothing to avoid the stimulus
 - 2. intermittent behavior of subject is described as anxiety
- 3. Aversive stimuli may be primary or secondary
 - a. primary: response is related to natural properties
 - 1. withdraw from electric shock
 - 2. withdraw from bright light
 - b. secondary (conditioned): properties are derived by previous association with primary
 - 1. verbal threats
 - 2. sight of unpleasant people
 - 3. frightening experience
 - c. a stimulus is aversive if a response is strengthened by its removal or depressed by its presentation
 - 1. normal effects are the opposite of what we find in positively reinforced stimuli

B. Escape behavior in humans

Text I, 212

- 1. To move into the shade when the sun is too hot or put on dark glasses to escape the rays, dress in warm clothes when the temperature drops, remove shoes when feet hurt are all examples of escape
- 2. Conditioned stimuli operate as above
 - a. walk away from people who are annoying

- b. turn off TV when program is boring
 - c. sight of vicious animal makes us move away
3. Most common characteristics of escape behavior is that person renders himself inaccessible to others
- a. great danger in excessive escape behavior
 - 1. very difficult to treat when it is chronic
 - 2. more likely to lead to behavioral disorders
 - b. escape is caused by the multitude of aversive stimuli presented to the individual throughout its history
 - 1. child reared with few contacts may not develop social behavior to allow him to overcome aversive stimuli later in life
 - 2. physical weakness can be a cause (submitting to bully causes him to run and hide when he next sees the bully)
 - 3. escape presents immediate advantage since less likely to arouse hostility or invite retaliation from others
 - c. once escape response is developed
 - 1. frequently leads to continuous avoidance and chronic withdrawal from human contact
 - 2. if it doesn't reach chronic stage it can still keep the person from reaching his potential
 - d. measures to prevent deterioration because of the escape response
 - 1. recognize it early by being aware of the symptoms
 - 2. place a suspect into situations with others where he can easily be reinforced
 - 3. don't put him in situations where he can work alone and thus reinforce his escape
 - 4. personal attention and approval are valuable tools to reverse the trend

C. Avoidance behavior in humans

- 1. Avoidance is more common than escape since it is not necessary on each new occasion to have the aversive stimulus presented before action is taken

- a. anticipate trouble when we first see approaching signs

- b. shun people who annoy us
 - c. evade situations that may be dangerous
- 2. Why avoidance is dangerous and undesirable
 - a. frequently results in mental disorder
 - b. has tendency to promote physical disorders
- 3. Vast degree of control may be achieved in utilizing avoidance conditioning
 - a. tell child not to do something, this will result in avoidance response if previous warnings have been followed by slap or spanking
 - b. verbal apology serves to avoid the aversive threat (if you don't apologize you will regret it)
- 4. Persistent use of aversive stimuli may have disastrous affects upon the subject
 - a. adult chooses vocation that enables him to avoid human contact
 - b. distant person that becomes tense at the approach of a friend
 - c. result in hypochondriacs and chronically fatigued persons
 - d. often takes the form of fantasy or daydreaming
- 5. Reasons for excessive avoidance behavior
 - a. long subjection to restrictive and excessive discipline in childhood
 - b. excessive criticism of one's acts by other people
 - c. deprivation and neglect
 - d. inadequate occasions for social stimuli to operate as conditioned positive reinforcers
- 6. What can be done to retard the excessive avoidance response
 - a. since escape often moves directly into avoidances, all recommendations for escape are applicable
 - b. clinical aid will be required in most cases if it has progressed to the chronic stage

D. Punishment

Text I, 243

- 1. The effect of the aversive stimulus is to depress the behavior when it is presented -- not strengthen it.
 - a. criticized for inappropriate actions.

- b. blamed for mistakes
 - c. penalized for infraction of rules
 - d. child spanked for misbehavior
 - e. traffic tickets, fines, jail
 - f. business punishes by firing, docking pay, demoting
- 2. Punishment can depress a response, it does not permanently eliminate it
 - a. child grabs cookie, slapped, does not grab again (at least while the controller is in the room)
- 3. Depressing effect only temporary if response has been positively reinforced
 - a. receive traffic ticket so we reduce speed for a few days
 - b. history of repeat offenders in penal institutions
- 4. Strong punishment is more effective in depressing undesired responses than weak punishment
 - a. harsh lashing more efficient than weak slap
 - b. long intense verbal tirade is more efficient than the caustic work
- 5. Punishment is most effective when delivered immediately following the response
 - a. telling child he will be spanked that evening by his father for something broken at noon is in effect saying child is being punished for the return of his father
 - b. current legal system (civilian and military) could be improved with this utilization
- 6. Regular punishment will depress response much more effectively than intermittent punishment
- 7. Punishment generalizes its depressing characteristics
 - a. verbal chastisement for single inappropriate remark often keeps subject silent on all subjects
- 8. Why punishment is utilized despite its temporary nature and numerous unfavorable characteristics
 - a. immediate effect of suppressing an undesirable response
 - b. simple and easy to administer
 - c. by depressing undesirable responses it is possible to encourage direction towards favorable responses

- d. additive result of punishment and positive reinforcement to desired response have helped the learning process
- e. punishment is positively reinforcing to the administrator through the submission of the subject

E. Anxiety

Text I, 262

- 1. When it is known that a neutral stimulus is to be followed by a primary aversive stimulus
 - a. sight of the whip in the hand of an approaching father
 - b. air raid warning
 - c. student is called to the dean's office
- 2. Impossibility of escape is characteristic of anxiety
 - a. if it were possible to escape the result would be an avoidance reaction
- 3. Occasions for anxiety
 - a. impossibility of overt escape
 - b. anticipation of punishment
 - c. separation from support (child from parent)
- 4. Consequences of anxiety
 - a. sleep interfered with
 - b. generally miserable condition
 - c. relations with others is jeopardized
 - d. unable to enjoy positive reinforcements available to those with no anxiety
 - e. can lead to organ pathology
- 5. What can be done to reduce anxiety
 - a. much is result of childhood which is beyond our control
 - b. attempt to eliminate situations that are occasions for anxiety

SUMMARY:

You should be able to recognize the escape, avoidance, and anxiety behavioral traits. Be aware of the fact that much of your personnel's behavior is a direct result of one of the mentioned situations. Realize that occasionally the avoidance response will not function because it is being maintained by providing removal of the conditioned negative reinforcer which in turn initiates extinction. This means that occasionally even your best man is going to step out of line to get his shock, which will put him back on the avoidance pattern.

Know that punishment is not an effective means of eliminating behavior, but acts as a depressant. If it is necessary to utilize it, utilize it effectively by carrying through on your threats of behavior in a consistent manner. Know that punishment does not speed up extinction of behavior. The more positively reinforced the behavior is, that you are attempting to depress, the more difficult it will be to depress through punishment.

SECTION VI

Individual and Group Control

The idea of one person or of any group controlling any human's behavior is a distasteful thought; however, it is a common occurrence. Employers state the time and place that you arrive on the job. Law enforcement agencies are watchful for rule breakers. No matter how distasteful the subject, it is a fact that all behavior is influenced by some division of our society.

Control is a function of all managers and supervisors. The type and extent will depend on the personality of the manager. There are many methods and techniques available to control people. Money, sex, security and political strength are some approaches that may be utilized. Personnel behavior is controlled through various methods including advertising and propaganda. The inherent limitations in control have necessitated the manipulation of available variables.

Physical control provides the most immediate results but normally is only temporary. Attention is constantly required of the controlling force and there are high probabilities of associated unpleasant dispositions.

The manipulation of the stimuli directly associated with the action of the subject is a more acceptable method of control. Advertising personnel constantly do stimuli manipulation rather than forcibly persuading potential buyers to purchase their product. An undesirable action may be eliminated by positively reinforcing incompatible responses to induce the desired behavior.

Reinforcement is a very effective technique of direct control. The reinforcer may be verbal, monetary, sexual, threatening or many others

that can be imagined. Very often the actual manipulation of stimuli is achieved by utilizing conditioned reinforcement. Deferred or insufficient reinforcement is likely to be more of a detriment than a useful manipulator of stimuli or behavior.

In most cases an overabundance of reinforcement will shape behavior more effectively than deprivation or lack of reinforcers. This concept relates to the person constantly attempting to gain attention, and who then ceases when the attention received is not of the type desired.

The disadvantages associated with physical control are such that behavioral control via manipulation of stimuli is a more attractive method for management. Reinforcement of personnel responses will provide adequate and efficient behavior control when the application is made in an educated manner.

TITLE: INDIVIDUAL AND GROUP CONTROL

- OBJECTIVES:
- A. Acquaint the class with the various methods utilized by one person or group to control another person
 - B. Provide comparisons of effectiveness of the various techniques of control
 - C. Compare group control with individual controlling techniques

INTRODUCTION: A. All of us in management positions that have been required to "give out tasks" to subordinates have experienced varied reactions to the same order by individuals. We will attempt to improve our skills as a "controller" by recognizing controls that are utilized by individuals and groups

PRESENTATION: A. Individual Control

Text II, 314

- 1. Type and extent depend upon personal skill of the controller
 - a. strong man uses variables which are derived from his strength
 - b. wealthy man resorts to money
 - c. pretty girl uses primary or conditioned sexual reinforcement
- 2. All factors in 1 have strong controlling characteristics, however when compared with practices of organized agencies they would have to be considered weak. The limitations of personal control have required the manipulating of available variables to reach optimum control
 - a. salesman keeps prospect within range
 - b. counselor faces similar problem
 - c. entertainer, writer, musician, artist all must use reinforcement to keep within range of buyer
- 3. Techniques of Control
 - a. physical force most immediately effective
 - b. most extreme is death
 - c. handcuffs, strait jackets, jails all use physical restraint, this has many disadvantages

Text II, 316

4. Disadvantages of physical restraint

- a. requires sustained attention of controller
- b. exclusively concerned with prevention of behavior
- c. little value in increasing probability of action
- d. generates strong emotional dispositions towards counterattack
- e. cannot be applied to all forms of behavior
- f. never available to those that lack necessary power

B. Manipulating stimuli to reinforce

- 1. since physical restraint has so many disadvantages most controlling situations demand another method. Most of the other methods are completed through manipulation of stimuli that is directly associated with the actions of others.

- a. "elicit" reflex responses when we utilize emetic to induce vomiting
- b. manipulate "discriminative" occasions when arranging merchandise in saleable manner
- c. "eliminate" behavior by evoking incompatible responses

1. mirrors along corridor to slow women

- d. "supplement" stimuli to induce buying

1. salesman assures buyer he will profit from the product

- e. "imitative" by inducing friend to have another drink by buying another for self

1. testimonial advertising

Text II, 316

C. Reinforcement as a direct technique of control

- 1. Money or goods may be used to reinforce, i.e., wages, bribes, gratuities, sexual stimulation are forms of reinforcement in personal control

- 2. Many times preceded by more immediate conditioned reinforcers

- a. check, contracts
- b. praise, thanks

- 3. Deferred reinforcements are likely to be unreliable

- a. checks not honored
- b. promises made in bad faith

4. Negative reinforcement (aversive stimuli) is employed in personal control
 - a. cry of child
 - b. nuisance value of a particular adult
5. Conditioned aversive stimulation
 - a. dare
 - b. shame into action
6. Punishment (removal of positive reinforcers)
 - a. cutting a dependent out of a will
 - b. imposing economic sanctions
 - c. refusing customary sexual contact
7. Deprivation and satiation
 - a. in controlling child's behavior by reinforcement through candy, first must ensure little is received at other times
 - b. having an employee live just beyond his means (make him hungry)
 - c. satiation is a good technique of eliminating unwanted behavior, i.e., child stops teasing for candy when he has been given all he can eat.

D. Objections to personal control

1. Many people find control of other humans distasteful. This does not alter the fact that it is possible to control people but does explain why almost all proposed changes in government are promoted by pointing to their effect in maximizing freedom.
 - a. control is frequently aversive to the controllee
 1. due to the aversive feeling he who undertakes to control other people is likely to be countercontrolled by all of them
 2. individuals who engage in control automatically generate conditioned aversive self-stimulation - he feels guilty about exerting the control

E. Group control

1. The individual is subjected to a more powerful control when two or more persons manipulate variables having a common effect upon his behavior
2. One man's positive reinforcement is another man's negative

- a. child that takes a toy is reinforced, the child that loses the toy is adversely reinforced
 - b. successful suitor creates an aversive condition for all others
- 3. Since an individual may affect all others of the group their counter-control may be undertaken together
- 4. Techniques employed by groups to control an individual
 - a. individual behavior classified "good or bad" and is reinforced or punished accordingly
 - b. individual is called good if he reinforces other members of the group
- 5. Effect of group control
 - a. works at least temporarily to the disadvantage of the individual
 - b. the effect of group control is in conflict with the strong primarily reinforced behavior of the individual
 - c. selfish behavior is restrained and altruism is encouraged but this helps individuals because they are controlling the practices of others
- 6. Power of the group
 - a. very great as witnessed by the political tyrant, despotic father, bully in the gang that usually yield to the group

SUMMARY:

Although most managers in government or business will be "controlling subordinates through his delegated position in the group," this does not mean that he does not need to utilize personal control in a most efficient manner. The good manager is the person who can obtain the desired result from his subordinates by his efficient personal control rather than depending upon his "position". Good personal control, utilizing the conditioned reinforcers mentioned in an earlier lesson in an efficient manner is the best method. It has fewer undesirable qualities than other techniques mentioned.

SECTION VII

Summary

Response reinforcement has been presented in a capsule manner in this program with the intention of making the reader at least aware of the potential involved in the handling of human behavior. This technique of controlling behavior consists of various types and degrees of rewarding personnel for their performance. It can be as effective as managerial personnel desire to make it. The only requirement is that the supervisor must know both his job and personnel before indulging in behavior control.

The primary sections of this program to review are those covering schedules, conditioned, and negative reinforcement. These sections present the basic training on the concept of reinforcement. The other sections are provided to help the reader to see the reinforcement concept within the framework of total human behavior. Continuous response reinforcement, though not very practical in the real world, is approached in enough cases to be considered in this discussion. The subject tends to learn at an increased rate when reinforced at every available opportunity. His retention of the material learned will be a function of the personal attractiveness the material holds for the individual. In general, this method of reinforcement would be preferred in a rapid learning situation where extinction of the learned response is not a critical matter.

Intermittent reinforcement would be a preferred method in the average situation where a rapid response learning rate is not required, but retention of the learned response is important. This concept is prevalent in industry and in the military where personnel are taught many subjects with the expectation of minimal extinction. The subjects of intermittent

reinforcement learn at a slower rate than continuous but will retain the learned response for a greater period of time.

When conditioned or secondary reinforcement is mixed with the application of a primary reinforcer on an intermittent schedule, the response is prolonged over a longer period of extinction. The strength of the secondary reinforcer is dependent on the frequency of the primary reinforcement. Conditioned reinforcement might well be the most subtle and casual of the methods discussed. An important aspect of behavior control is the lack of knowledge by the subjects that their behavior is being manipulated.

Negative reinforcement should be avoided whenever there are more feasible alternatives available. Punishment is not effective in extinguishing the response and only represses it until another time. An effective manner of shaping behavior must produce more permanent responses than aversive stimuli is capable of producing.

A word of caution must be inserted at this point. The manipulation of personnel behavior tends to place the manipulator in a critical position. It would behoove the administrator of reinforcement to study the possible adverse affects of overcontrolling personnel.

Some of the effects of overcontrol have resulted in juvenile delinquency or in the type of life associated with a hermit. People will rebel at too much control and the only point of differentiation in their reaction is the point at which they leave the submissive path and express their rebellion. This expression may be of any number of mannerisms but the fact is they have been abused and are aware of the fact and are expressing their disapproval of and to society.

Therefore, the advantages to society resulting from the control of behavior are weighted on the opposite extreme by the disadvantages of improper behavioral control. The efficient manager must make use of all knowledge available in controlling personnel. By efficiently varying the methods of reinforcement and by observing the reactions of his personnel, he will be able to avoid improper and excessive utilization of control.

TITLE: BY-PRODUCTS OF EXCESSIVE OR INCONSISTENT CONTROL

- OBJECTIVES:
- A. Acquaint the class with limitations of control
 - B. To caution the class on over control
 - C. To acquaint the class with "danger signs" that indicate excessive control

INTRODUCTION A. We have noted that control is normally exercised on the individual from many sources: parents, employers, associates, religious institutes, governmental agencies, etc. Most of these controls are to restrict the selfish, primarily reinforced behavior of the individual. However, certain by-products are not an advantage for the controller and are often harmful to the individual and group objectives. Anyone using a technique of control must know not only its positive potential but its negative potential as well.

PRESENTATION: A. Results of excessive or inconsistent control

1. Escape

a. run away from the controller

- 1. hermit withdraws
- 2. boy runs away from home

b. withdraw without being separated

- 1. disbelief
- 2. defection
- 3. renunciation of citizenship

2. Revolt

a. counterattack the controlling agent

b. criticize the controller

c. vandalism (destruction of school property)

d. religious revolt

- 1. directed to specific agency (protestant reform, atheism)

e. governmental control

- 1. political revolution
- 2. impeachment
- 3. vote of no confidence

3. Passive resistance

- a. not behaving in conformity with controlling practices
 - 1. often occurs when efforts to escape or revolt have been extinguished, i.e., mule does not respond to the whip, child becomes stubborn, Gandhi

4. Reactions to passive resistance

- a. usually intensify practices to break the resistance but in the long run this will not solve the problem. Many times it just multiplies the difficulties.

5. Fear

- a. reflex responses in glands and smooth muscles
- b. change in behavior (increase in strength of behavior which has led to escape and a general weakening of other behavior)
- c. little interest in food, sex or artistic enterprises
- d. extreme case will essentially paralyze the individual
- e. can result in excessive fear of father, police, God, sex, etc.

6. Anxiety

- a. may vary in intensity from slight worry to extreme dread

7. Anger or rage

- a. responses of glands and muscles
- b. aggressive overt behavior
- c. weakening of other behavior
- d. may be displaced from controlling agent to other people or things in general (temper tantrum)

8. Depression

- a. stubborn child sulks
- b. resentful, moody, listless, bored
- c. frequent depression can ruin individual's health
- d. may turn to alcohol to suppress the depression

9. Excessively vigorous behavior

- a. not adapted to reality
- b. aimless wandering or searching
- c. preoccupation with "doing something else"

10. Excessively restrained behavior

- a. caution in driving after an accident
- b. if talking is controlled to excess may stop talking completely

11. Defective self-knowledge

- a. simple boasting to escape incompetency
- b. delusions of grandeur

12. Aversive self-stimulation

- a. may injure himself if control is carried to extreme
- b. arrange to be injured by others

B. Remedy for excessive control

- 1. If excessive control is diagnosed at an early stage it ~~can be~~ alleviated by removing some of the controls that are at the disposal of the controller or controllers. If it has progressed to any degree psychotherapy is the only hope for the individual and obviously the earlier in the history of the individual the more opportunity he has of becoming normal.

SUMMARY:

Many advantages can be achieved for the company, group, country, religion, or home through the control of the individual. It has been demonstrated that of all of the methods of control available the method with the least derogatory effect is positive reinforcement. However, all methods of control have a negative potential as well as a positive potential. The manager should always be watchful for symptoms of excessive control and should adjust his controlling techniques and personal behavior to "fit the situation".

GLOSSARY

aversive stimulus - an unpleasant stimulus (e.g., pain) which an organism seeks to avoid

conditioned stimulus - a stimulus which has acquired the ability to evoke a reflex response

conditioning - a process by which a new stimulus comes to elicit a response

continuous reinforcement - reinforcing every response

deprivation - act of depriving; to hinder from possessing

extinction - the process by which a conditioned stimulus loses the power to elicit the conditioned response

intermittent reinforcement - occasional reinforcement of behavior

negative reinforcement - reinforcement which consists of terminating stimuli (e. g., painful stimuli)

operant - that type of behavior which operates or acts upon the environment; key pecking or head movements; without stimulus

operant behavior - that behavior which is influenced by the consequences of previous, similar responses

positive reinforcement - reinforcement which consists of presenting stimuli (e. g., food or praise)

Reinforcement - that event which increases the probability the prior response will occur again; a technical term for reward

reinforcer - that something which provides the reinforcement

respondent behavior - that behavior which is influenced by the preceeding stimulus

response - an act which may be either emitted or elicited

satiation - filled to satisfaction; elimination of desire for (e.g., bloated with water)

secondary reinforcement - conditioned (associated) reinforcement; normally accompanies primary reinforcement (bell ringing for the lunch period)

stimulus - that which elicits a response

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Effective response reinforcement :



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